

THE PLOTTER

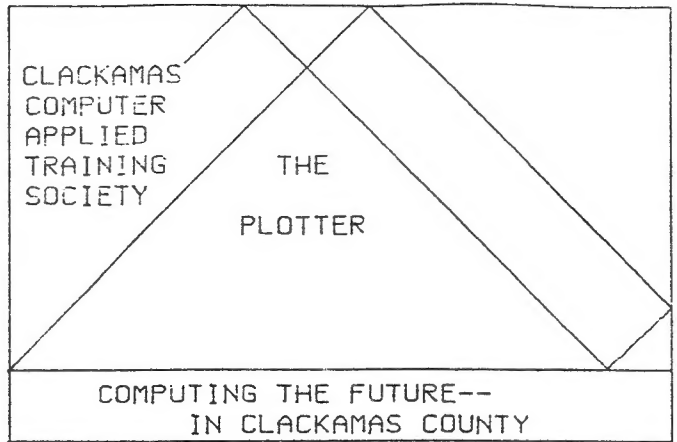
CLACKAMAS COMPUTER APPLIED
TRAINING SOCIETY
NEWS LETTER

NUMBER 6

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JUNE

1994



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FROM THE EDITOR'S
DESK

This month we continue with the dissertation on BASIC programming by Jim Wagner. Worthwhile suggestions are offered to the programmer.

MEETING

The JUNE meeting will be:

on: SUN., JUNE 12, 1994

MEETING 2:00 TO 5:00 P.M.
at: Rod Gowen's home
14784 S. Quail Circle
Oregon City

WHAT YOU WILL FIND IN THIS ISSUE:

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Readers will note that we offer an order form for ordering THE BEST OF THE PLOTTER, the long delayed reprint of many of the articles and programs that have appeared in our newsletter in over 10 years of publishing. This material is mostly original with members, or in some cases reworked programs written for other computers. The May meeting was devoted to assembling a batch of books that had been printed and collated at a print shop. As we have not checked every page for every book but have depended on the print shop for all pages being in proper place it just may be that a page may be missing. If a purchaser should find such a thing we ask that we be notified so we can send a punched page.

Members should note that the June meeting falls on the second Sunday as the third Sunday is FATHER'S DAY. We do have members who are in this category.

Now that we are free of our dedicated task of putting out a book, we should be back on schedule of normal meetings. Hopefully we will be able to take advantage of Rod's facilities and have some demonstrations of some of the interesting things members do with their equipment. Of particular interest would be a demo of packet radio operation.

Carefull readers will note that the mast head has been changed to a different printing of the plotted image. We include an article about this. We are still using our trusty 2068 to produce this image.

TIM X THE TUTOR by Bill Dunlop

Perhaps you know someone that is home schooling their child. These days a lot of folks are. For whatever reason they have chosen this course, and there are good reasons for many, these parents could use all of the tools and helps that are available. Why shouldn't you suggest one of the best learning tools that I have ever found? The T/S 2068.

My foster son has had almost every disadvantage known to todays society thrown at him. As a result he has low self esteem and almost no successful school environment for most of his 13 + years of existance. What he does NOT need is more "special" education, though he does need a lot more education. The 2068 does not get impatient with his slow learning or his poor reading. It does not mind repeating the last lesson again or going back to re-explain the "rules" of punctuation. No other students calling him names for missing an answer to discourage or upset him just him and his "friend", his tutor, the 2068.

So, why the 2068 instead of a "real" (MeSsDOS) computer? Several good reasons only one of which is the fact that it is NOT compatable with his friends game disks or their game cartridges.

Very, very, low initial cost is another good reason. If they own a standard cassette tape player and a standard black & white (or color) TV they could add a 2068 from RMG with a pack of good educational software software for less than \$100.00.

Quite a few "lessons" (aka programs) are available. Many subjects from spelling and punctuation thru math and science starting from pre-school levels of time telling through highschool chemistry and, naturally, computer programming and electronics. Special needs programmms are available, though some must be customized an so may need to be mail-ordered.

I have quite a few programs that I have modified and have added advanced levels to that I am making available through RMG. If you or your friends have suggestions for others let me know, through RMG, and I will try to be of help.

COMMODORE 1520 PLOTTER

Dick Wagner

Some time ago I suggested some possible up-dating of Page 1 of this newsletter. Having had a commodore 1520 plotter for a few years plus John McMichael's programming and interface (Oliger) but not having actually done any programming for it, now seemed to be a time to get at it and see what I had. Page 1 shows the results of the plotting for the graph, making it similar in size to the old TS 1000/2040 print and the more recent 2068/Epson printer output.

The lines are thinner as they are a normal line width for this plotter. The lettering can be adjusted for position by defining the start of each line.

The program uses letters before the X and Y variables to define the kind of move that is to be made, relative or absolute, pen up and pen down (draw). It seems to be something like the Turtle programming popular a few years ago. John's programming is a way to adopt the Commodore system to the 2068. This is a serial machine so it uses a serial interface.

The plotter uses a 4 1/4 inch roll of adding machine paper so my image of about 3 1/2 inches fitted nicely. Actually, the printed width is a bit less than this 4 1/4 inches as the maximum line length across the paper is 479 dots with a spacing of 0.2 mm or 0.0078 inches. This figures to be about 3 3/4 inches. I elected to take the inside dimensions of the original image as the plotting was to fit inside.

The following program shows how I produced a workable program, lines 10-60 being from John's programs while my additions of lines 100-310 draws the picture and adds the text.

```

10 LOAD /"pdr"CODE : LET x=(PE
EK 23631+PEEK 23632*256)+15: POK
E x,0: POKE (x+1),91: OUT 63,7
20 BORDER 0: PAPER 0: CLS : IN
K 6: PRINT AT 10,0; FLASH 1;"TUR
N 1520 PRINTER/PLOTTER ON NOW":
BEEP 1,20: PAUSE 400: INK 7
30 CLS
60 LPRINT CHR$ 25;0: LPRINT CH
R$ 26;1: LPRINT CHR$ 27;0: LPRIN
T CHR$ 28;0
100 LPRINT : LPRINT : LPRINT "C
CAT CHART"
120 LPRINT CHR$ 24;"M10,-320"
130 LPRINT
140 LPRINT CHR$ 24;"I"
150 LPRINT CHR$ 24;"R0,0"
160 LPRINT CHR$ 24;"J0,288"
170 LPRINT CHR$ 24;"J440,288"
180 LPRINT CHR$ 24;"J440,0"
190 LPRINT CHR$ 24;"J-440,0"
200 LPRINT CHR$ 24;"R0,48"
210 LPRINT CHR$ 24;"J440,48"
220 LPRINT CHR$ 24;"R0,48"
250 LPRINT CHR$ 24;"J240,288"
260 LPRINT CHR$ 24;"J440,88"
270 LPRINT CHR$ 24;"J397,48"
280 LPRINT CHR$ 24;"J157,288"
290 LPRINT CHR$ 24;"J117,248"
300 LPRINT CHR$ 24;"R0,24": LPR
INT "      COMPUTING THE FUTURE--
                        IN CLACKA
MAS COUNTY"
310 LPRINT CHR$ 24;"R10,250": L
PRINT "CLACKAMAS

```

COMPUTER

APPLIED

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PLOT

TER"

PLOTTER PENS

Dick Wagner

Readers who have the COMMODORE 1520 plotter or the Radio Shack plotter (now out of production) can still get pens for these machines from some Radio Shack stores. Recently I found a few cards of pens at a local store so I am not sure if they were no longer being replaced or are a regular item.

The stock number for 3 black pens to a package is 26-1480. The 3 color pens (red, blue, green) is 26-1481. The price is \$2.95 each. As I recall, we used to get 4 pens to a package.

A 2068 QUICKIE

```

100 IF IN 127=255 THEN BEEP .1,
0: BEEP 1,5: PRINT IN 127;: PRIN
T " Hold up, I'm not ready to p
rint. Am I on line? Am I busy pr
inting? Check me out now."

```

```

110 IF IN 127<>255 THEN PRINT I
N 127;: PRINT " OK, I'm on line
and ready"

```

```

120 REM it would be safer to us
e the address from line 110 for
IN 127 and make it IF IN 127=add
ress THEN PRINT IN 127; etc

```

FOR IMMEDIATE RELEASE:

April 28, 1994

RMG ENTERPRISES AND CCATS USER GROUP OF OREGON CITY, OREGON, ARE PLEASED TO ANNOUNCE THE RELEASE OF THE NEW BOOK:

THE BEST OF THE PLOTTER

This long-awaited volume contains what we hope is the best that we could glean from the past 12 years of THE PLOTTER, the newsletter of CCATS. Over 100 pages of original programs, tips, reviews, how-to articles and much, much more. We did not include anything that came from any source outside of our own user group. The book covers the ZX81/TS1000/TS1500/TS2068 and SINCLAIR QL as well as the peripherals that were developed for these computers.

Fully indexed with table of contents and easy to find section separators, this comb-bound 8.5x11" volume will be a great addition to your TS library.

The price is \$14.95 postpaid per copy. There is an order form at the back of each book to order more copies as gifts or to order the companion diskette that contains the programs listed in the book for the ts 2068. This disk will be available in LARKEN or OLIGER formats only. The price for the disk will be \$9.95 PP.

RMG Enterprises is the publisher and all orders or inquiries should be directed to:

RMG ENTERPRISES
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OREGON CITY, OR 97045

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RMG UPDATE NEWS FOR JUNE 1994

VOLUME 6, NUMBER 6

** RMG NEWS **

THE BIG NEWS!-This time is the fact that the book THE BEST OF THE PLOTTER, is finally ready! By the time you read this, we will be shipping this book out to any who may want to order it.

The volume has ended up with 108 numbered pages plus the table of contents, index, order forms, covers and separator pages. It is a comb-bound, 8 1/2 x 11 inch book. We think we did a pretty good job, considering the fact that only 3-5 people were ever working on it for the last 2 years or more.

As we told you when we started the project, the book contains only items from the pages of THE PLOTTER that originated WITHIN our group. If the author was a dues-paying member of CCATS, then their article, review, project or program was eligible to be included. With over 800+ pages of newsletters to pore over, you can imagine why it took so long. The book is divided into 5 sections that cover all of the Sinclair/Timex models from the ZX81 to the QL and a lot of peripherals that were and are used with them. The fifth section is a retrospective of the first 10 years of the group and the newsletter.

At the back of the book you will find 2 order forms: one for additional copies of the book and one for the disk for the 2068 that will contain most of the programs listed in the book.

As we noted in the past, and as noted on the enclosed order form, the price is just \$14.95 postpaid.

Sales from our consignment sheets is way down as can be seen by the small number of consignment pages in this month's envelope. We were supposed to be getting some new items to list, but the owners did not get the lists in or approved in time to make this mailing. We hope to have them for you by next time.

Are you using a piece of software that you really like? Are you looking for a piece of software that will perform a particular job or that may be customized to suit your particular job? If so, why not drop us a line and let us know. Write a small review if you are using one you like and let us publish your questions. Who knows, maybe there is someone out there who is already doing what you want to do! (This is not limited to T/S computers, it includes MS-DOS software as well.)

That's about all for this month. We hope to be able to bring you more next month. Let us know what you think of our endeavor. Oh, by the way, if you are a regular subscriber, watch your envelopes for a notice if your subscription is expiring.

KEEP WATCHIN' FOR MORE NEWS! Rod Gowen, Owner, RMG Enterprises
14784 South Quail Grove Circle, Oregon City, OR 97045
503/655-7484 8AM-6PM PT * FAX/VOICEMAIL: 503/655-4116 24 HRS

C. STRUCTURE

1. Avoid (read NEVER, NEVER) multiple entry points to subroutines.
2. Avoid multiple exit points from subroutines.
3. If names are permitted for subroutines, use names which are as descriptive as possible, even if they seem a little long.
4. Sometimes subroutines make sense, even if the subcode is used only one place in the rest of the program. Breaking out a block of code as a subroutine may make the code easier to read. It often permits better documentation with comments than would fit where the code would appear in the program section which calls it. For example, if a section of a routine (perhaps a few dozen lines) sends a character to the serial port, break out those lines as a subroutine, & name it (if permitted) SENDCHAR. Then, something like "call SENDCHAR" appears in the section of code which uses this. This makes it much easier to see what is happening when you come back later without having to struggle with details. At the place where the subroutine is written out, you can place a whole block of information which tells how the subroutine works. When you come back to change or debug the program, you need not wade through the documentation unless you really want to, and you know more about what the program is intended to do.
5. Avoid multiple operations per line (as permitted in BASIC). Especially, do not cram operations together just to save lines. This prohibition is less strong if the operations are really intimately related.
6. Avoid GOTOs. Do not use them unless there is no other way out!
7. DOCUMENT! Even if the program is only for your own use, do it. Unless a line is totally obvious, say why it is there and what is happening. Documentation adds little to the execution speed of a program (none, if it is compiled). When the program is compiled rather than interpreted, it adds absolutely nothing to the size of the program which actually runs. Here is an example of a subroutine header:

```
1000 REM =====
1001 REM This subroutine sends a character in $OUTCHAR to the serial port. It assumes that
1002 REM that the serial port has been initialized and that the COM port has been selected.
1003 REM The subroutine does not change any variables. If there is a character already in
1004 REM the serial port being sent and the new one cannot be sent immediately, the routine
1005 REM will wait until $OUTCHAR can be placed into the output.
1006 REM =====
1010 (body of subroutine)
```

In subroutine headers, it is very useful to specify what variables affect, in any way, the flow of the program within the routine. Also list any variables which are changed inside the subroutine. So often, when trying to find problems, it is easy to overlook a statement within the code (especially on multi-statement lines). If you have it all written out in such a header, then you always know where to look to find the information you need without scanning code. It is also very important to remember to update the header every time you change that section of the program.

D. VARIABLE NAMES

1. Avoid meaningless variable names. Example, x,y,z (unless you are using them somewhere that they have a very common usage, such as 2D or 3D rectangular coordinate system).
2. Choose names which represent how the variable is actually used. For example, if a variable is going to hold a count value, name it "COUNT", not "M"!
3. Reserve one variable for a single use. Avoid multiple uses. Example, do not use COUNT for a bit-counter in one place and a character counter in another. The chance for error is too high!

E. CONSTANTS

Constants are values which cannot change during the execution of a program. They do not take any memory space. That is, they do not take any more than if you had used an explicit number. For example, in the statement "IF X=1 THEN...", the "1" is a constant and it does not change during the program. With normal BASIC, the statement "IF X=Y THEN..." uses two variables, "X" and "Y"; they both take memory space and either is permitted to change while the program runs. "Named constants" permits you to use names for constants. When the program compiles or begins to run, the compiler or interpreter simply substitutes the number value everywhere the name appears as one of its very first actions. Once this is done, the program runs as if there are numbers instead of the names.

If your language implementation permits named constants (GW Basic does not, Quick Basic does), use them. An example is decision making. Suppose that you have a variable (call it DIRECTN) with one value which represents up and another value, down (maybe for sprite motion). If you say that up is represented by 0 and down by 1, you might have statements like IF DIRECTN=0 THEN But if you are able to name constants, you could say UP=0 and DOWN=1. Then the decision statement becomes IF DIRECTN=UP THEN... It should be quite obvious that this kind of statement is much easier to read and interpret without question when you have to come back later.

F. USER INTERFACE

Look carefully at other programs. Observe those features which make programs difficult to use and those which make it genuinely easy. Pop-up menus (in the Windows/Macintosh style) are becoming more widely recognized. The more you can make your program like another in the interface, the easier it will be to use because the user will not have to relearn. In spite of what you might think, popup menus can be done in DOS, even in purely text (that is, non-graphic) screens.

Also, when designing an interface, go through it carefully for what seems "intuitive". At each point in the program, try to imagine "what action seems most natural here". If there is even a hint of an answer, try to make it work that way.

Plan for on-line help from the very beginning of writing a program. The more logical you can make a program feel and the better the on-line help you provide, the less documentation needed. Your goal should be no support documentation required! This is likely impossible (since something is usually needed to tell how to install the program). But it is a worthwhile goal.

When keys are used to control on-screen motion, as in games, choose the keys carefully. There are some conventions which have grown up for keys representing up/down/left/right and a few other standard game functions. Try to use the same pattern used in other programs. If there is no standard pattern, choose keys which seem to fit naturally. Avoid long stretches, caps shifts, etc. If you have to use control or alt keys, most people prefer the left hand for the control or alt so avoid alphabetic keys in the same half of the keyboard. For example, ALT-P is fine but alt-Z is poor. This is particularly true for the many keyboards which have only one control and one alt key. When you choose keys, also take into account the fact that not all keyboards have the same set of keys or keys in the same pattern. For example, F11 and F12 are missing from many keyboards. An even better choice is to make key assignments user selectable; its not very hard and it makes the key usage, at least, the way the user likes.

JIM'S ARTICLE WILL BE CONTINUED IN A LATER ISSUE

-NOTICE-

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